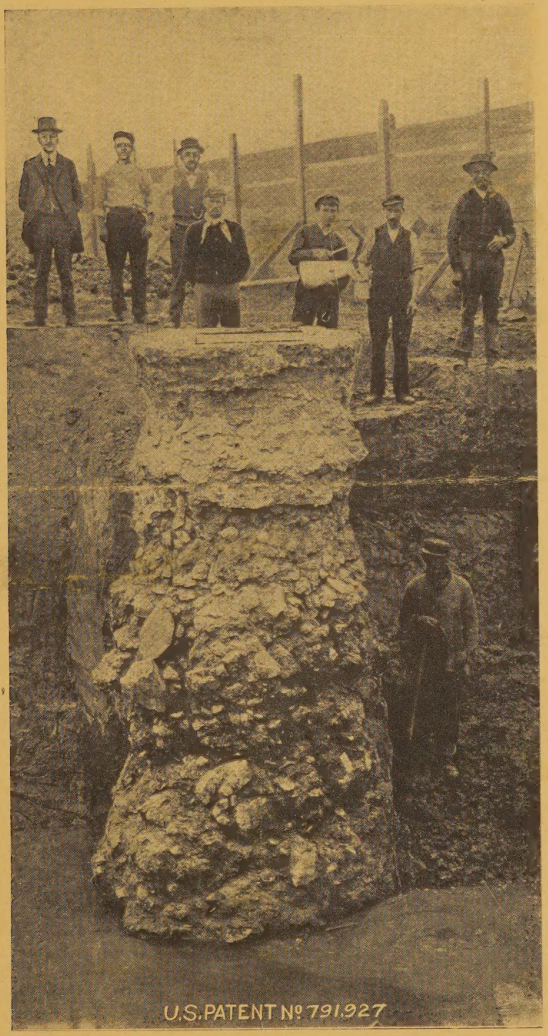
APR 30 '18

COMPRESSOL FOUNDATIONS



Hennebique Construction Co.
1170 Broadway
NEW YORK CITY

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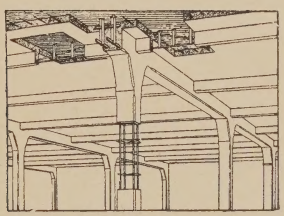
HENNEBIQUE CONSTRUCTION CO.

CONSULTING ENGINEERS
AND
CONTRACTORS

OWNERS OF THE HENNEBIQUE SYSTEM OF REINFORCED CONCRETE

United States Representatives for the
COMPRESSOL SYSTEM OF FOUNDATIONS



MAIN OFFICE, **1170 BROADWAY** NEW YORK

BRANCHES UNITED STATES AND CANADA

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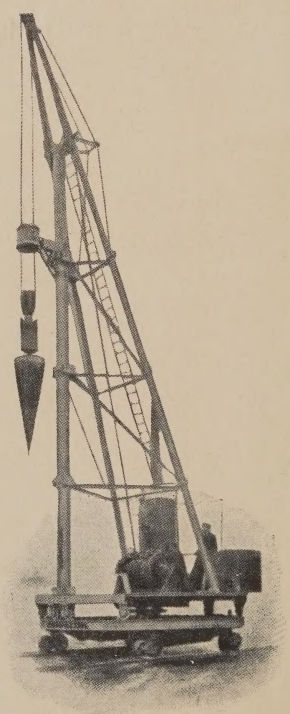
THE COMPRESSOL SYSTEM

THE Compressol System, the most modern system of foundations, is a new patented method of building permanent pile foundations.

It consists of piercing the ground by dropping a heavy steel pointed weight, thus compressing the soil laterally and vertically and filling the resultant cavity with concrete. The concrete is tamped with a rammer, and the final result is a supporting column, larger at the base than at the top, and unexcelled for bearing purposes.

DESIGN

The design of the foundation follows the ordinary rules of pile construction. The supporting power of each pillar or column is taken at 90 to 120 tons, according to the nature of the soil.

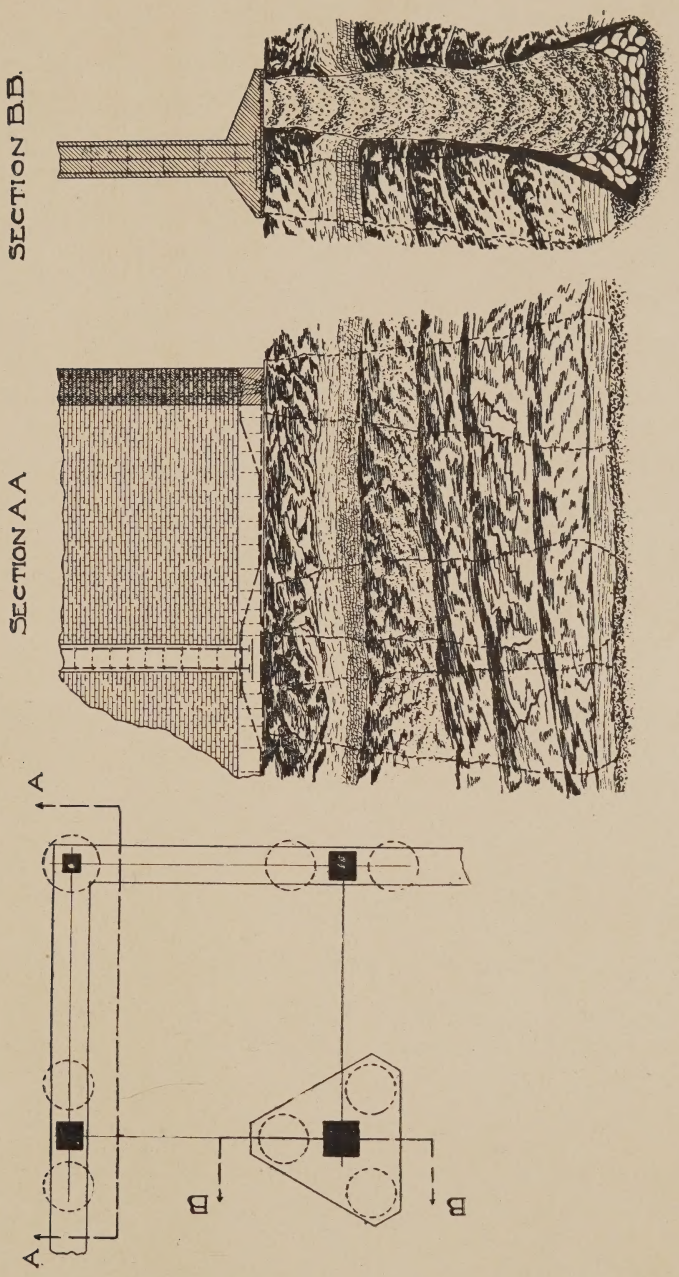


APPARATUS

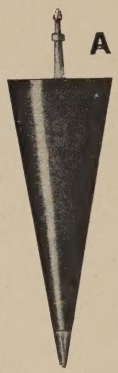
The pillars are constructed in a very simple way with the following apparatus:

1. A machine similar to a pile driver, which lifts a rammer to the required height. This machine is generally 55' high and provided with a powerful hoist.

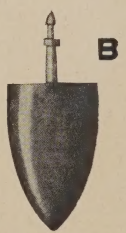
2. An automatic fastener, to which the rammer is suspended, and by which it is hoisted to the required height.



TYPICAL DESIGN OF THE COMPRESSOL FOUNDATION OF A BUILDING



3. A perforating rammer "A" of conical form, weighing two tons, and having a diameter of 3' at the base. It falls freely from a height of about 30', with the point directly towards the soil. Each rammer is provided with a rod having its upper part similar to a top, on which the fastener takes its grip The rammer in use is lifted up, and when the fastener reaches the ring, it automatically releases its grip. The rammer, falling freely, perforates the soil. The fastener is then lowered and again grips the rammer, to repeat the operation until the entire soil is perforated to good bearing strata.



4. A tamping rammer "B" of olive shape, weighing two tons, and having a diameter at the base of 2'6". This falls freely from the same height as the perforating rammer, with the point directly towards the soil.

PERFORATION

The perforator acts as a wedge in falling and compresses the soil laterally. In this way a strong sheeting is formed, which prevents the soil from caving in. In wet soil the lateral compression in most cases will keep the water out. In particularly bad ground, a wheel-barrow load of clay, dropped in the hole after each fall of the perforator, will form temporary waterproofing.

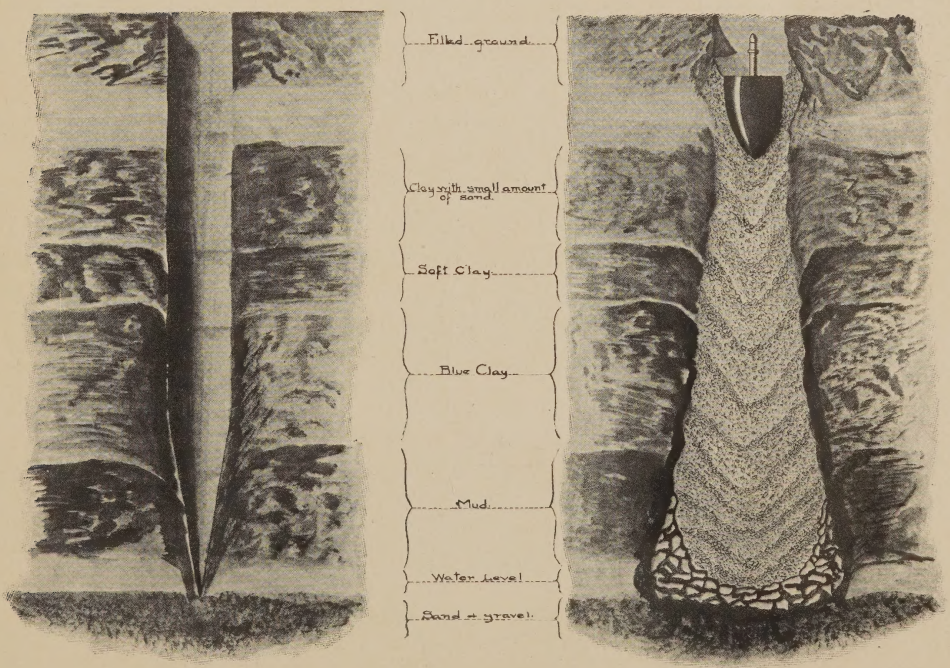
TAMPING AND FILLING

After the ground is perforated to a solid stratum, the work proceeds as follows:

Boulders are first deposited and rammed with the tamper. (Fig. 2). Then concrete is poured in and tamped in the same way. Sometimes one layer of concrete will require only one blow of the rammer; sometimes three or four. This depends entirely on the compressibility of the adjacent soil and whether the filling material spreads out laterally or not.

It can be seen that a uniform strength of the pillar and a uniform compression of the adjoining soil is obtained automatically, and perfect safety for the foundation is assured. The filling material will penetrate the soft strata and form a series of ridges, thus further increasing the amount of lateral friction between the uneven sides of the pillar and the soil, and adding greatly to the strength of the construction.

Fig 1. *Fig 2.*



ADAPTABILITY

Waterproofing the sides of the hole permits the use of the Compressol pile in all kinds of sub-soil.

ADVANTAGES

Simplicity and Economy: No operation could be simpler Our estimate will convince you that it is cheaper.

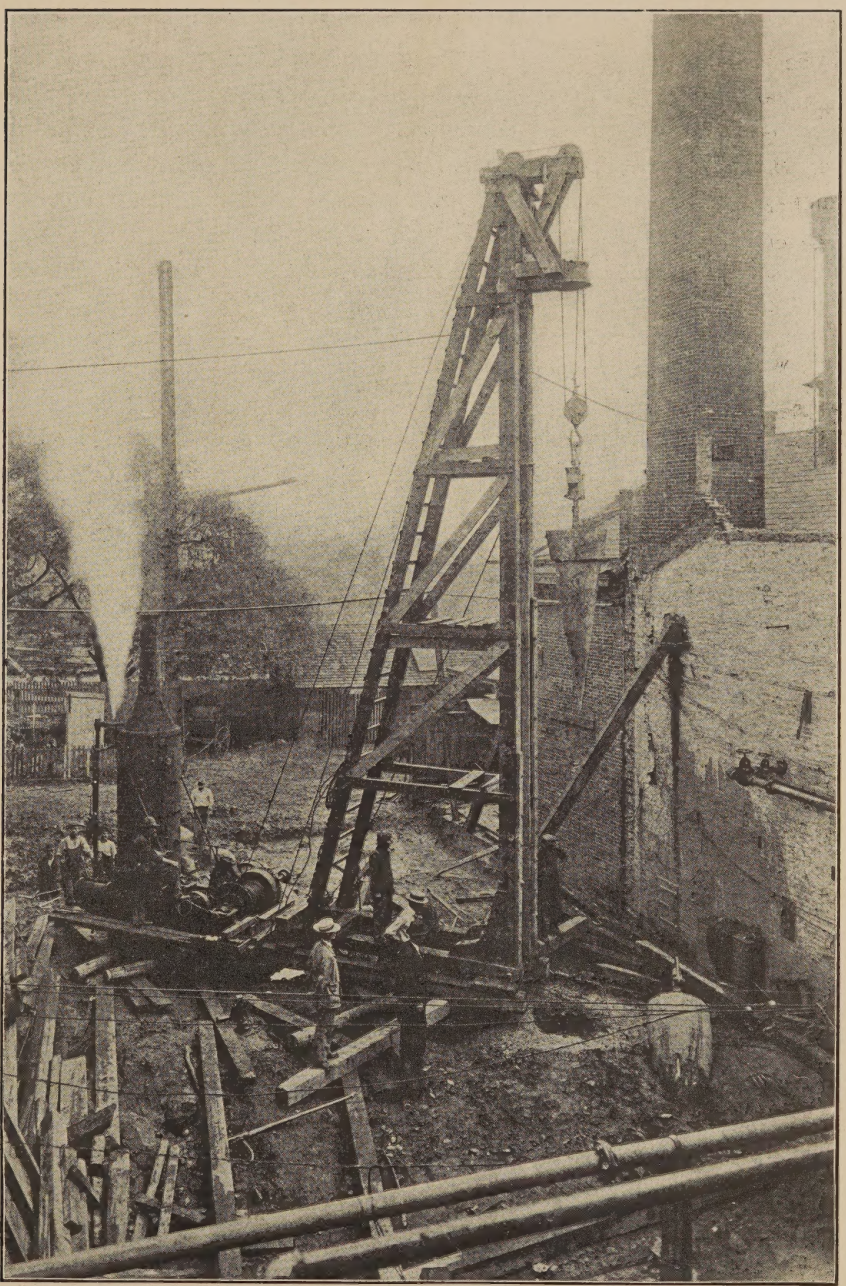
Rapidity of Construction: In moderately bad ground two piles can be sunk, tamped and filled in about 8 hours. This is evidently equal to about twelve ordinary concrete piles per day per pile driver.

Safety During Construction: All the work is done above ground and the dangers and delays of Caisson work are eliminated.

Equal Bearing Capacity: The bearing power of each pile is accurately determined at every point by recording the penetration of the conical rammer in different strata of the sub-soil.

A PILE FOUNDATION NEAR NEW YORK

Compressol piles were used for the foundation of the Power House for the Roessler & Hasslacher Chemical Company at Perth Amboy, N. J., in September 1909. The foundation was constructed within 100 ft. of Staten Island Sound under what would ordinarily be very difficult conditions. A fairly compact fill was found for a depth of 4 ft. below the surface, below which, for 8 or 12 ft., was a very soft and practically fluid silt resting on a hard stratum of sand and gravel, of unknown depth. The sub-soil was constantly waterlogged as the ground surface was barely above the level of high tide.



WORK AT PERTH AMBOY, N. J.

The heavy vibrating loads of the engines and air compressors in the basement of the power house made it absolutely necessary to guard against any settlement which would be certain to effect the engine bearings and possibly break the pipe joints. Ordinary piles were out of the question as the soft stratum offered no resistance to lateral motion. Thus the choice was reduced to wells filled with concrete or caissons.

We quote from a letter sent from the office of Walter Kidde, Engineer Constructor, 90 West Street, New York City, who was in charge of the improvements for the Chemical Company.

October 4th, 1909

Hennebique Construction Company,
1170 Broadway,
New York City, N. Y.

Re - ROESSLER & HASSLACHER CHEMICAL COMPANY
PLANT No. 1. PERTH AMBOY, N. J.

Dear Sirs:

In providing provisions for the outshore end of the power house under construction, a decision was made to use your compressol pillar system to get uniform bearing values and in order to avoid the use of wooden piles with the subsequent tendency for vibration.

The character of the ground, i.e. - a fill on top of an old salt marsh near the water front-gave promise of a thorough test of your method. The first trial showed that water and sand flowed freely as soon as the compact top filled material was removed or pierced. However, with the use of the clay lining, these difficulties were overcome and you were successful in the undertaking and a very good foundation was obtained.

I have no hesitation in recommending compressol pillars for similar conditions and requirements.

Yours very truly,

(Signed) WALTER KIDDE
A. B. MILLER
Engineer Constructor

It should be noted in this connection that some 15' head of water was held back, by the use of clay previously mentioned, long enough to place and tamp the concrete.

For a detailed description of this work, see Engineering Record for Nov. 27, 1909

THE COMPRESSOL PILLAR AS IT APPEARS IN THE SOIL

TEST

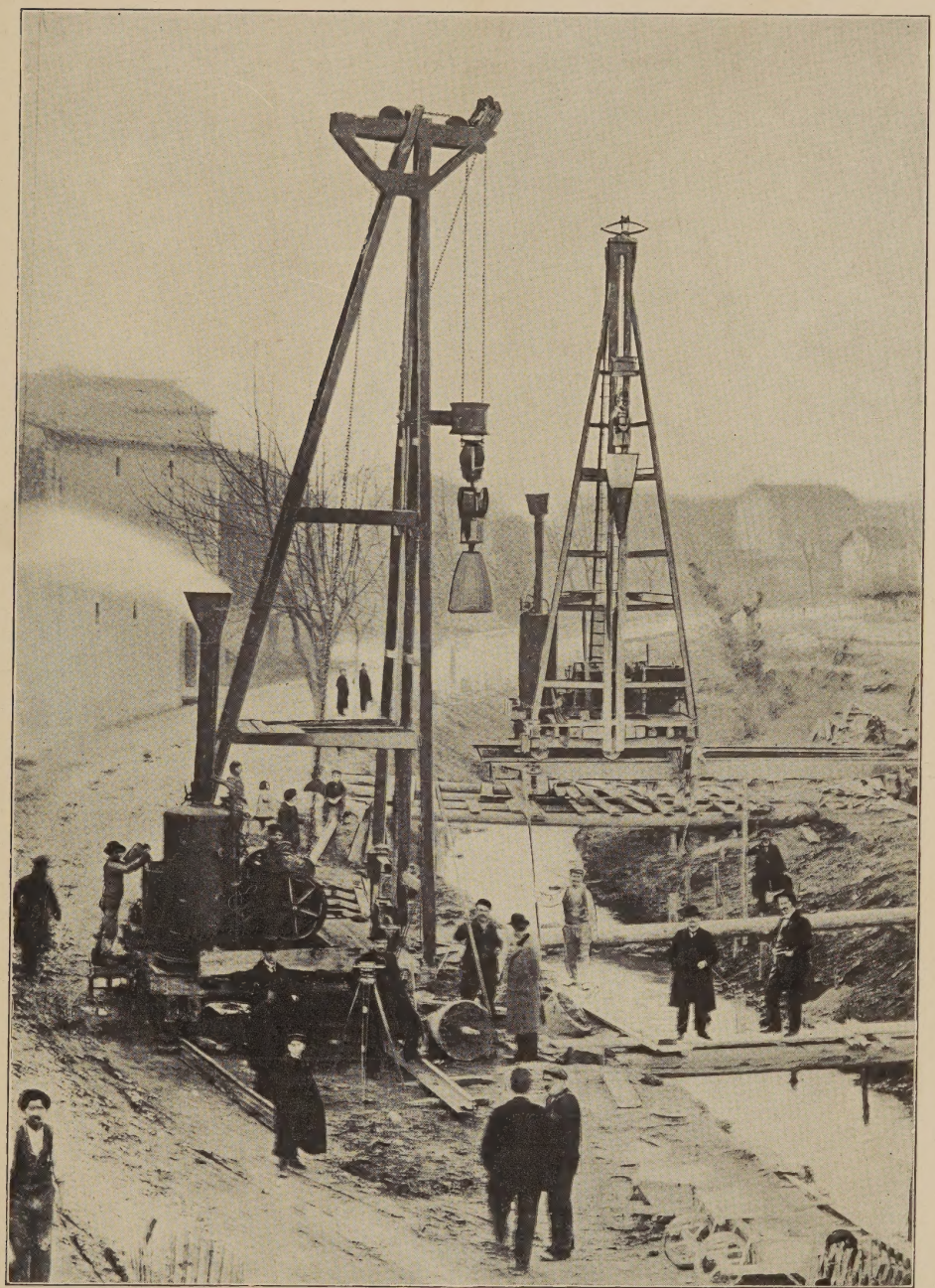
No Engineering Construction receives the unqualified endorsement of the profession until full and complete tests have been made and published.

We quote from an article by W. F. Johnson in the Engineering Record of September 25th, 1909:

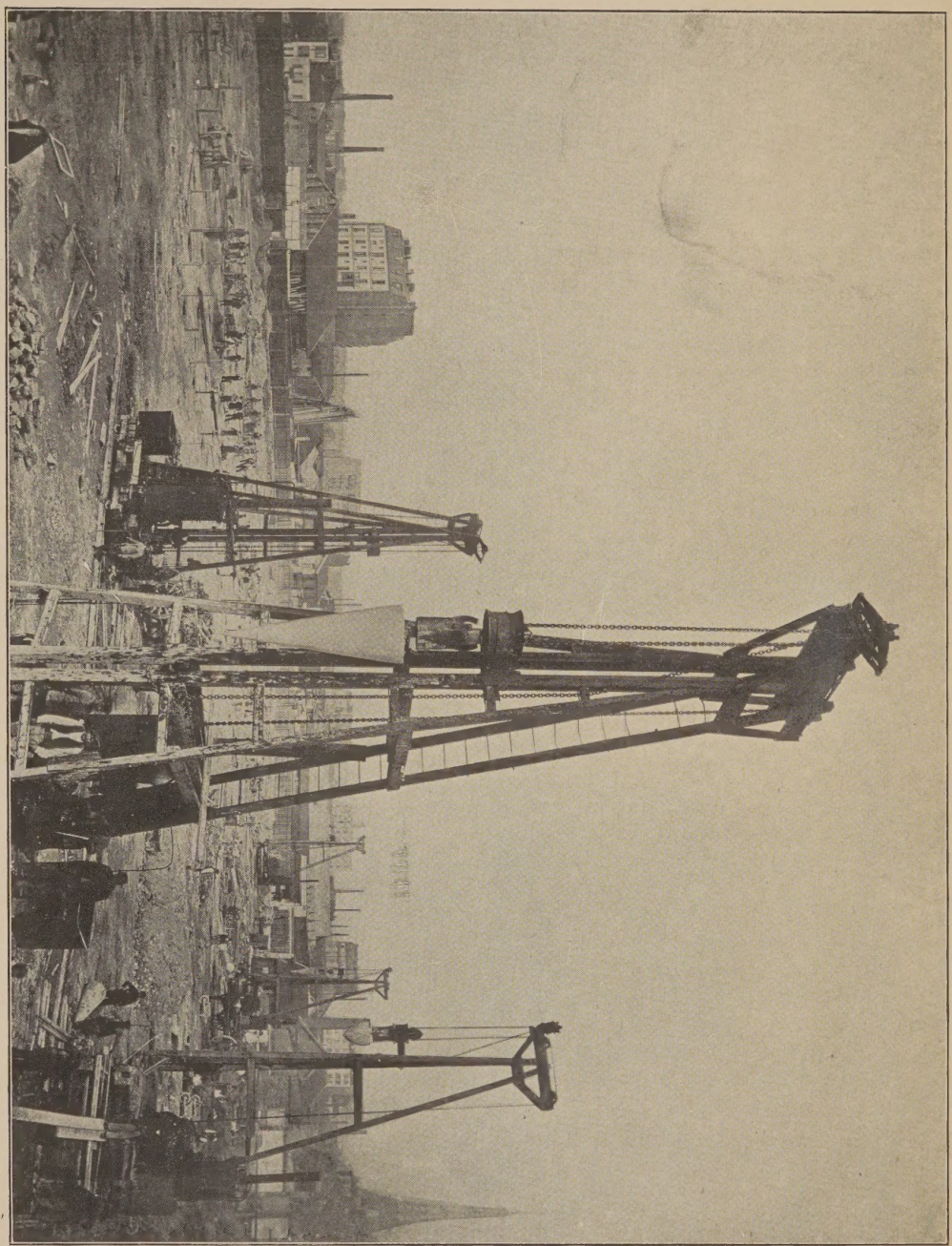
The bearing capacity of piles of this type was tested during 1907 in Vienna under the direction of the City's Construction Bureau, and in connection with the foundations for a seven-story building. The structure was located on filled ground coming from an excavation made for a brick works, the fill in some places being as much as 50 ft. deep. About 10 piles had already been placed when the authorities required an official test to be made before proceeding further. Accordingly, a direct load test was made of one of the piles already in place and chosen at random. Its height was about 25 ft. and it probably did not rest on any except the filled ground, which, however had been dumped there long ago. A frame work 16 ft. square and 13 ft. deep, forming a large box, was placed on top of the pile, and a number of jacks were distributed around the outside, so that the box could be raised off of the pile when needed. Operations were commenced on Oct. 10, and the test was concluded on Oct. 17, being constantly supervised by an Inspector of the Construction Bureau, together with the well-known engineer Von Emperger, and representatives of the architect and the construction firm.

The first test was made with a total load of 66 tons, including the weight of the box, which was approximately 13.2 tons. The loading material was placed in the box, and when the total was in place, the jacks were slacked off and the weight transferred to the pile. Readings with the instruments showed no settlement. The load was then increased to 119 tons, and a very slight settlement noted, but so small that it was not considered worth recording. The load was again lifted from the pile by the jacks and after being increased to 167 tons was again placed on the pile and allowed to remain for 72 hours. No change was noted in this test. In the fourth case the box was loaded nearly to the top and then piled up with timbers so as to give a total load of 183 tons. After some days a reading of the level was taken and the settlement was found to be but one millimeter.

As a result of these tests the Construction Bureau permitted the use of the piles and allowed them to be loaded to two thirds of the ma ximum test load, or a total of 121 tons each. The above maximum test load represents a pressure of 300 lbs. per square inch, the piles having a standard diameter of one meter. The piles, however, can evidently support a still higher load under suitable ground conditions and as a result of tests at the Louvroil Bridge the piles were allowed to carry from 900 to 925 lbs. per square inch of vertical load.



BRIDGE ABUTMENT FOUNDATION, AVIGNON



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